

Youth Violence and Juvenile Justice

<http://yvj.sagepub.com>

Implementing Effective Community-Based Prevention Programs in the Community Youth Development Study

Abigail A. Fagan, Koren Hanson, J. David Hawkins and Michael W. Arthur
Youth Violence and Juvenile Justice 2008; 6; 256
DOI: 10.1177/1541204008315937

The online version of this article can be found at:
<http://yvj.sagepub.com/cgi/content/abstract/6/3/256>

Published by:



<http://www.sagepublications.com>

On behalf of:



[Academy of Criminal Justice Sciences](#)

Additional services and information for *Youth Violence and Juvenile Justice* can be found at:

Email Alerts: <http://yvj.sagepub.com/cgi/alerts>

Subscriptions: <http://yvj.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations <http://yvj.sagepub.com/cgi/content/refs/6/3/256>

Implementing Effective Community-Based Prevention Programs in the Community Youth Development Study

Abigail A. Fagan

University of South Carolina

Koren Hanson

J. David Hawkins

Michael W. Arthur

University of Washington School of Social Work

There is mixed evidence regarding the extent to which communities can replicate science-based substance use and delinquency prevention programs with high implementation fidelity, that is, in close adherence to the theoretical rationale and specifications of the program. This article examines implementation of 16 tested and effective preventive interventions replicated during 2004–2006 by 12 communities participating in the Community Youth Development Study. Results revealed that across all programs the majority of required material, core components, and lessons were delivered; implementers were prepared, enthusiastic, and used a variety of teaching practices to convey material; and high levels of engagement by program participants were observed. The results indicate that, using a comprehensive system to proactively monitor implementation, community coalitions can ensure high-quality replication of effective prevention programs.

Keywords: *community coalition; drug abuse and delinquency; prevention; implementation fidelity*

Awareness of the need to implement substance abuse and violence prevention programs with high fidelity is growing due to increased demand from funding agencies for communities to implement prevention programs that have been previously tested and demonstrated to reduce involvement in problem behaviors (Hallfors, Pankratz, & Hartman, 2007), coupled with evidence that participant outcomes are stronger when the fidelity of these

Authors' Note: This work was supported by a research grant from the National Institute on Drug Abuse (R01 DA015183-01A1) with cofunding from the National Cancer Institute, the National Institute on Child Health and Human Development, the National Institute of Mental Health, and the Center for Substance Abuse Prevention. The authors wish to acknowledge the contributions of the communities participating in the Community Youth Development Study. An earlier version of this article was presented in May 2007 at the Society for Prevention Research annual meeting held in Washington, D.C. Please address correspondence to Abigail A. Fagan, Department of Criminology and Criminal Justice, University of South Carolina, Columbia, SC 29208; e-mail: fagana@gwm.sc.edu.

programs is maintained (Abbott et al., 1998; Botvin, Mihalic, & Grotzinger, 1998; Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Kam, Greenberg, & Walls, 2003; Mihalic, 2004; Spoth, Gyll, Trudeau, & Goldberg-Lillehoj, 2002). Delivering interventions in a manner congruent with the theory, content, and methods of delivery specified by program developers is important, yet communities often fail to achieve implementation fidelity outside of efficacy trials. A national assessment of school-based prevention programming (Hallfors & Godette, 2002) found that only 19% of districts were implementing curricula with fidelity, whereas the other districts delivered programs with untrained teachers, without the required materials, or with misspecification of the population to be served (e.g., targeting high-risk students with universal programs). The National Study of Delinquency Prevention in Schools (Gottfredson & Gottfredson, 2002) found poor implementation of many school-based delinquency prevention programs. Staff in more than 500 schools reported that, across 14 types of programs, 71% of the content was delivered, but only half of the programs followed recommended implementation practices. For example, for mentoring programs, many failed to use careful matching procedures, recognize children for good behavior, or monitor student outcomes. In addition, only one half of drug prevention curricula and one fourth of mentoring programs taught the recommended number of lessons (Gottfredson & Gottfredson, 2002).

In contrast to these studies, the Blueprints Initiative reported high levels of fidelity in two studies, one involving replications of eight violence prevention programs in 42 communities and a second study assessing the fidelity of the Life Skills Training (LST) drug prevention curriculum implemented in more than 400 schools. The first study demonstrated that after 2 years of implementation, 74% of sites implemented all core components of the violence prevention programs, and 57% achieved all dosage requirements (i.e., ensuring delivery of the recommended number, length, and frequency of program sessions; Elliott & Mihalic, 2004; Mihalic & Irwin, 2003). Replication of the LST curriculum was even more successful. According to observations of classroom sessions, instructors taught an average of 81% to 86% of all required material (Fagan & Mihalic, 2003). Another community-based initiative, the PROSPER trial, assessed implementation of one parent training and three school-based drug prevention curricula selected by 14 communities in two states. Across all programs, observers rated implementers as teaching of 90% of the program content (Spoth, Gyll, Lillehoj, Redmond, & Greenberg, 2007).

Although these evaluations suggest that communities can follow program guidelines, the extent to which community-based replications are implemented with full implementation fidelity is unknown because few studies have examined all four dimensions of implementation fidelity: adherence, dosage, quality of delivery, and participant responsiveness (Dusenbury, Brannigan, Falco, & Hansen, 2003). The studies described above have focused on adherence (i.e., the extent to which required program material is taught and core components implemented) and dosage (i.e., the degree to which all required lessons are taught), but they have not examined the quality of delivery of information nor participant responsiveness. As with adherence and dosage, deficits in the quality of delivery and participant responsiveness may lessen the likelihood of achieving desired participant change. For example, implementers who are not adequately prepared to teach or who lack support for the intervention (i.e., who demonstrate a poor quality of delivery) may fail to convey key

messages, and participants who are bored or unengaged may not retain information. In fact, a replication of the Project Alert curriculum (St Pierre, Osgood, Mincemoyer, Kaltreider, & Kauh, 2005) found that implementers taught 98% of program activities, but reduced student substance use was not achieved. Secondary analyses found that program outcomes were related to certain implementer characteristics such as sociability. The authors hypothesized that stronger effects occurred when implementers were better able to interact with and effectively engage students in activities. An effectiveness trial of the Strengthening Families Program (Gottfredson et al., 2006) also failed to replicate results shown in previous efficacy studies. The authors speculated that although the majority of content was taught, the skill of the implementers and the quality of their delivery style may have reduced the impact of the program on participants.

Although the quality of delivery of program materials and participant responsiveness to lessons are important mechanisms for preventing the development of problem behaviors, these elements have been overlooked in prior studies, perhaps because they are more subjective than adherence and dosage and, therefore, more difficult to define and measure. The quality of delivery generally refers to the method and style by which implementers convey material to participants (Dusenbury et al., 2003) and has been broadly conceptualized and measured as: implementers' knowledge of the program, preparedness to teach, visible support and enthusiasm for the program, pacing of the class, and use of interactive teaching practices (Dusenbury, Brannigan, Hansen, Walsh, & Falco, 2005; Rohrbach, Dent, Skara, Sun, & Sussman, 2007). Likewise, participant responsiveness has included assessments of participant attentiveness or boredom, level of involvement in lessons, positive reactions to the program, regular attendance at sessions, and the degree to which sessions are engaging and interactive (Dusenbury et al., 2005; Fagan & Mihalic, 2003; Rohrbach et al., 2007; Spoth et al., 2007). Some studies have also combined the two constructs. For example, in the Project Alert replication (St Pierre et al., 2005), quality of delivery was assessed according to eight items: student participation, student interest in the lesson, class control, teacher's solicitation of student responses, teacher's correct use of feedback, teacher's respect for students, teacher's conveyance of the purpose of lessons, and teacher's preparedness.

The inconsistent and infrequent assessment of quality of delivery and participant responsiveness, coupled with mixed evidence regarding adherence and dosage achieved during program replication, limits the ability to make strong conclusions regarding communities' ability to faithfully and fully implement effective substance abuse and delinquency prevention programs. With some exceptions, prior research has also been restricted to large-scale survey-based projects that cannot capture the complexity of program implementation in real world settings or has focused on single programs often implemented by a small number of facilitators, resulting in limited generalizability. The current study seeks to address these limitations by examining the adherence, dosage, quality of delivery, and participant responsiveness of 16 different prevention programs implemented in 12 communities participating in the Community Youth Development Study (CYDS).

Many of the 16 programs were implemented by multiple communities and the quality of implementation was assessed using similar instruments for all programs, thereby allowing examination of the extent to which implementation fidelity varies by program type and/or community. Implementation data was collected over 2 years, and the longitudinal data

allow us to determine whether or not implementation fidelity is more difficult to achieve during program startup compared with the maintenance phase, after communities and implementers have had some experience with replication, or if implementation fidelity declines over time as the excitement of adopting a new program wanes, the knowledge gained during initial training workshops is forgotten, and implementers are tempted to make changes to the curricula.

In a previous article (Fagan, Hawkins, Hanson, & Arthur, 2008), we found high rates of adherence and dosage across 13 prevention programs that had been adopted by the 12 CYDS communities during the 2004–2005 school year. In the current article, we extend our prior work to address three research questions.

1. Were levels of adherence and dosage maintained from 2004–2005 to 2005–2006?
2. To what extent were programs delivered in a high-quality manner that engaged participants over the 2 years of implementation?
3. What types of challenges were faced during implementation and to what extent did these challenges affect fidelity outcomes?

In a prior article (Fagan et al., 2008), we hypothesized that the strong adherence and dosage outcomes were due to a comprehensive program monitoring system used in the study, which combined local oversight by community prevention coalitions with external oversight by staff from the Social Development Research Group (SDRG) at the University of Washington. Given the continuation of this monitoring system, we expect that high rates of adherence and dosage would be maintained during the second year of implementation. In the current article, we also examine the frequency and types of modifications made during program delivery. Although there is debate regarding whether adaptations enhance or harm program implementation, there is little information regarding the types of changes that implementers make (Griner Hill, Maucione, & Hood, 2006) and whether the frequency and types of adaptations change over time.

Regarding the second research question, we predict high-quality implementation and active participant responsiveness, even given variability among program implementers in their familiarity and comfort using interactive teaching styles, time to prepare for lessons, whether they volunteered or were required to implement programs, and so on. This hypothesis is based on the fact that the fidelity monitoring system ensured that all staff received formal training in program protocols and a separate training emphasizing the importance of high program fidelity. Implementers also received feedback regarding their implementation practices based on observations of program sessions.

The third research question focuses on the types of challenges faced during implementation and their effects on implementation fidelity. Although implementers sometimes change programs to avoid or overcome implementation challenges, little is known about the types and frequency of problems encountered during replications (see Buston, Wight, Hart, & Scott, 2002; Conduct Problems Prevention Research Group, 2002; Fagan & Mihalic, 2003), whether challenges differ with different types of programs, and how implementers respond to challenges. This information is relevant to prevention program developers who may wish to refine their program materials, training workshops, and technical assistance protocols to help implementers avoid and/or overcome obstacles encountered during program delivery.

Method

The Community Youth Development Study

The CYDS is a community randomized trial of the efficacy of the Communities That Care (CTC) prevention operating system, a community-based system for preventing problem behaviors such as substance use, delinquency, and violence (Hawkins & Catalano, 1992; Hawkins, Catalano, & Arthur, 2002). CTC activities are planned and carried out by the CTC Community Board, a prevention coalition of community stakeholders who work together to promote positive youth outcomes. Board members participate in six training workshops that focus on coalition building and the skills needed to install the five-phase CTC system that includes (a) assessing community readiness to undertake collaborative prevention efforts; (b) forming a diverse and representative prevention coalition; (c) using epidemiologic data to assess prevention needs; (d) choosing evidence-based prevention policies, practices, and programs based on these data; and (e) implementing the new strategies with fidelity and monitoring program implementation and impact.

In fall of 2002, 24 small and medium-sized communities in seven states were randomly assigned to implement the CTC system or to a control condition in which communities conducted prevention services as usual. Starting in spring of 2003, the 12 intervention communities were provided with training and technical assistance in CTC, funding for a full-time CTC coordinator, and up to \$75,000 annually to replicate research-based prevention programs targeting fifth- to ninth-grade students and their families. Prevention program planning occurred during the 1st year of the study (2003–2004) and program implementation during the 2nd through 5th years (Hawkins et al., in press). This article reports outcomes at the end of the 3rd year, after 2 years of program implementation (2004–2005 and 2005–2006).

CTC training and technical assistance were provided to the 12 intervention communities by certified CTC trainers from the Channing Bete Company (the former distributors of the CTC program) and by staff at the SDRG at the University of Washington. SDRG staff provided technical assistance to local CTC coordinators and prevention coalition members to help ensure full implementation of the CTC operating system, including prevention program delivery. As part of weekly telephone calls and e-mail consultation, staff discussed prevention program implementation challenges and solutions to overcome barriers. SDRG staff made site visits at least twice annually to observe program sessions, meet program staff and administrators, and personally support CTC and program implementation. SDRG staff also analyzed implementation data and provided regular written reports summarizing the results.

Prevention Program Selection

Each intervention community created a prevention coalition, the CTC Community Board, in 2003. As part of the CTC process, the board reviewed student-reported data on levels of risk factors, protective factors, and problem behaviors (i.e., substance use, delinquency, and violence) to identify elevated risk factors and depressed protective factors they would target with prevention programs. Boards then selected programs from a menu of options from the *CTC Prevention Strategies Guide* (Hawkins & Catalano, 2004; <http://preventionplatform.samhsa.gov/>), all of which had been previously evaluated in at least one

study using a strong research design and had demonstrated effects on risk or protective factors and problem behaviors. All programs on the CYDS menu targeted students in Grades 5 through 9, and/or their parents, consistent with the study's focus on preventing adolescent problem behaviors.

The 12 intervention communities selected 13 different prevention programs to implement during the 2004–2005 school year and 16 programs to implement during the 2005–2006 school year. As shown in Table 1, strategies included parent training programs (group-based and self-administered programs), after-school programs (skills-based interventions, mentoring, and tutoring services), and school-based programs (drug prevention curricula and schoolwide organizational change strategies). About half the programs were chosen by multiple communities and many programs were delivered more than once during the year. For example, the LST program was delivered in one school in one community and four schools in a second community in 2004–2005, resulting in five replications, or cycles. Similarly, Guiding Good Choices was provided 38 times (i.e., 38 cycles) across 6 communities in 2004–2005.

All programs implemented in 2004–2005 were continued the next year and several sites added programs in 2005–2006. The number of program cycles also increased over time, especially for parent training programs. In total, 13 programs and 95 cycles were implemented in 2004–2005, and 16 programs and 156 cycles were implemented during 2005–2006 (see Table 1).

Prevention Program Monitoring System

All intervention sites were trained to enact a comprehensive program monitoring system that was developed as part of the CTC process to promote and measure the extent of implementation fidelity, including adherence, dosage, quality of delivery, and participant engagement (Fagan et al., 2008). The components of the system included (a) training for all program staff in the programs' theory, content, and delivery methods (delivered by program developers) and in the importance of implementation fidelity (delivered by CTC trainers and SDRG staff); (b) session checklists and/or surveys completed by program implementers and coordinators; (c) observations of program sessions conducted by implementers' supervisors, CTC Community Board members, or other community volunteers; (d) collection of attendance records; and (e) administration of pre- and postsurveys to measure desired changes in program participants.

The CTC system is designed to be community owned and operated (Hawkins & Catalano, 1992). In accordance with this philosophy, we intentionally designed the fidelity monitoring system and measurement tools to be easily understood and used by community volunteers, and we avoided highly sophisticated and very costly methods of program oversight (such as using paid research staff to observe or code videotaped program sessions). Our goal was to empower coalition members to lead the program monitoring effort and to be well placed to continue such efforts when project funding ended. Thus, the program implementation monitoring system was enacted and maintained locally by CTC coordinators, program staff, and members of the CTC Community Boards.

Table 1
Programs Implemented in the CYDS Intervention Communities, 2004-2006

Program	2004-2005		2005-2006	
	Number of Communities	Number of Cycles	Number of Communities	Number of Cycles
Parent training programs				
Strengthening Families Program 10-14	2	15	3	29
Guiding Good Choices	6	38	6	48
Parents Who Care	1	3	1	4
Family Matters	1	2	1	2
Parenting Wisely			1	2
After-school programs				
Stay SMART	3	9	3	15
Participate and Learn Skills	1	3	1	3
Big Brothers/Big Sisters	2	2	2	2
Tutoring	4	11	6	28
Valued Youth	1	3	1	3
School-based programs				
All Stars Core	1	1	1	2
Life Skills Training	2	5	2	11
Lion's Quest Skills for Adolescence	2	2	3	3
Program Development Evaluation	1	1	1	1
Project Alert			1	2
Olweus Bullying Prevention Program			1	1
Total		95		156

Note: CYDS = Community Youth Development Study.

Measures

Adherence. Adherence refers to the degree to which implementers taught the required program objectives or fulfilled the program's core components. Adherence was measured by fidelity checklists available from program developers (for 9 of the 16 programs) or developed by SDRG staff to be similar in content and scope. For structured programs with a discrete number of sessions,¹ session-specific checklists identified the content and activities to be taught each time the program met, and program implementers rated whether or not each objective was taught each session.² The adherence score was calculated as the percentage of objectives taught divided by the total number of objectives in all sessions. For example, an adherence score of 89% for LST indicates that 185 of the required 208 objectives were taught.

For less structured programs (i.e., programs without a specified number of sessions or specifying general guidelines rather than specific content), the adherence score represents the percentage of core components reported as completed by implementers and program coordinators. For example, for tutoring programs, tutors and tutoring coordinators rated whether or not six critical components were accomplished: tutor supervision, tutor screening for criminal background and knowledge of subject matter, tutor training, use of an

established curriculum, a tutor/tutee ratio of less than 1:4, and assessments of changes in tutees' knowledge or attitudes.

For each type of program, adherence was assessed for each community by averaging reports across all implementers and all cycles delivered, then averaging scores for all communities that implemented the program. When checklists were not returned, all items on the form that assessed program adherence were treated as missing. When checklists were returned but adherence data on the forms were missing, omitted items were counted as unmet objectives. Missing data were minimal; 8.2% of checklists and/or data were missing during 2004–2005, and 2.1% of information was missing in 2005–2006. The high rates of completion indicate that communities were using the implementation monitoring system as intended.

Observations of 10% to 15% of program sessions were used to validate self-reported adherence information from the fidelity checklists completed in the eight structured programs (though no observations were completed in 2005–2006 for Project Alert, due to scheduling difficulties). Observations were not conducted for unstructured programs, as two were self-administered parent programs (Family Matters and Parenting Wisely); three (Big Brothers/Big Sisters, Tutoring, and Valued Youth) had one-on-one or small-group administration, which made observation overly intrusive; and two (Program Development Evaluation and Olweus Bullying Prevention Program) were schoolwide interventions with multiple components not easily observed. Observations were conducted for the classroom component of Olweus and for the Participate and Learn Skills programs, but observers did not complete fidelity checklists to validate adherence for these two programs.

Program observations were conducted by implementers' supervisors (program coordinators and school or social service agency administrators), CTC Community Board members, and other community volunteers. Program coordinators arranged observations, trained observers in the basic principles of the programs and procedures for completing the observation forms, and typically notified implementers in advance of the date they were to be observed.

Observers were asked to complete the same fidelity checklists as program implementers. A reliability score was calculated by comparing the number of objectives on which the observer and implementer agreed on the level of coverage (i.e., both rated the objective as *met* or both rated the objective as *not met*). For example, if a program session had nine objectives to be taught and both raters indicated that seven objectives were met but disagreed as to whether the other two objectives were covered, the level of agreement was calculated as 78%. Agreement scores were totaled across all observed sessions for each program to achieve an overall level of agreement between observer and implementer. Missing data were not included in the agreement calculations.

The adherence measure also included self-reported modifications to session content. On each session checklist for the eight structured programs, implementers indicated whether or not they made any of the following adaptations: adding or deleting material, using guest speakers not trained in the program, and adding audiovisual materials. SDRG staff reviewed these reports and, based on their understanding of the programs, characterized changes as (a) significant and problematic deviations from the program's content, theory, or intended practices or (b) enhancements to the program. Problematic deviations included deleting program activities (because doing so could eliminate efficacious program elements) or adding

new content or videos (because doing so took time away from required material and potentially introduced harmful material). Enhancements were changes that helped illustrate or reinforce program content, such as creating handouts to review material or presenting local drug statistics in lessons intended to correct misperceptions of substance use rates.

Dosage. Dosage measured delivery of the required number, length, and frequency of sessions as documented on the fidelity assessment checklists, which listed dates and duration of each session. Scores for each dosage element (i.e., the number, length, and frequency of sessions) were calculated according to the following criteria. First, the percentage of required sessions taught was assessed, such that teaching 6 of 12 sessions resulted in a dosage score of 50%. Second, the actual length of the program session was compared with the required length. Program cycles in which the average session length matched the requirement were scored 100%. If sessions were shorter than recommended, the percentage of the recommended time that was achieved was calculated (e.g., cycles that had 30-min rather than 45-min sessions were scored 67%).³ Third, the frequency of sessions delivered during the program cycle was coded as a dichotomous measure with cycles meeting specifications scored 100% and those that did not scored zero. Programs for which a required number, length, or frequency of sessions were not specified by developers were coded as missing on that component. The three dosage elements were then averaged to form a dosage score for the program cycle, all cycles were averaged to calculate the overall dosage score for each community, and scores for all sites that taught the program were combined to create the overall program dosage score.

Quality of delivery. The quality of implementation delivery focused on the teaching skills of the presenter and was based on observer reports for 10 of the 16 programs (the eight structured programs, as well as Participate and Learn Skills (PALS) and classroom sessions of the Olweus program). Observers rated the degree to which the implementer provided clear explanations, kept on time, seemed rushed or hurried, and used stories to illustrate points, as well as the implementer's knowledge of the program, enthusiasm, poise/confidence, rapport with participants, and ability to answer questions. These nine items, and one item regarding the overall quality of the session, were each rated on a 5-point scale in which higher scores indicated a higher quality delivery of the material. Scores on these items were combined and averaged to form a quality of delivery scale (Cronbach's alpha was .88 in 2004–2005 and .90 in 2005–2006).

Given prior literature relating the use of interactive teaching techniques to effective substance abuse prevention programs (Tobler & Stratton, 1997), observers also estimated the percentage of time in each session devoted to skills practice, discussion, lecture, or video viewing. We report the proportion of time spent on each area.

For both measures of the quality of delivery, scores were averaged across all implementers teaching the program in the community and across all cycles and communities.

Participant responsiveness. Participant responsiveness was rated by observers on the observation form as the degree to which participants understood the material and participated in the lesson, both assessed on a 5-point scale. These two items were combined and

scores were averaged across all implementers and communities conducting the 10 observed programs.

Program participation. Program implementers recorded attendance at each session for parent training and after-school programs. School officials reported attendance at school programs as the number and percentage of students in the targeted grade who attended school each day during the semester(s) in which the program was taught.

Implementation challenges. Challenges were identified by both program and SDRG staff. Implementers recorded on session checklists whether or not they encountered participant misbehavior, lack of participant responsiveness, shortage of time, or problems with location or facilities. SDRG staff identified implementation challenges based on technical assistance contacts. In this article, we summarize major obstacles that were common across communities and cases in which program challenges were sufficiently great to lead to the discontinuation of programs.

Results

Adherence

Adherence rates were very high over the 2 years of program implementation. Implementers reported achieving the majority of core components and/or teaching most of the required objectives in the parent training, after-school, and school-based programs. As shown in Table 2, adherence improved slightly over the 2 years for most programs, with rates averaging 91% in 2004–2005 and 94% in 2005–2006. Only one program (Program Development Evaluation) markedly decreased in adherence over the 2 years (from 93% to 54%). Adherence rates were high in each of the communities implementing the same program and for most cycles of implementation. For example, adherence scores for the six communities implementing Guiding Good Choices in 2005–2006 ranged from 97% to 100%, and rates for the three communities delivering Stay SMART ranged from 93% to 100% (data not shown). Likewise, adherence for the 48 cycles of Guiding Good Choices delivered in 2005–2006 was consistently strong and ranged from 88% to 100% (see Table 2). There was some variation in adherence across different implementers teaching the same program, with checklists indicating anywhere from zero coverage (indicating the lesson was skipped) to full coverage of material.

Observers and implementers had high rates of agreement on adherence scores reported on the fidelity checklists, as shown in Table 2. Across all programs assessed, rates of agreement between implementers and observers averaged 93% in each year, with little variation across the programs. The lowest level of agreement for any program was 88% in 2004–2005 and 83% in 2005–2006. These results indicate a strong overall correspondence between observer and implementer reports of program adherence.

Program modifications reported by implementers are listed in Table 3. Deleting information or activities from lessons was the most common deviation, reported on 13% of all fidelity checklists in 2004–2005 and 14% of checklists in the following year. Adding

Table 2
Program Adherence in the CYDS Intervention Communities, 2004-2006

Program	2004-2005		2005-2006	
	Average Adherence Score (Range ^a)	Average Observation Agreement Score (Number of Comparisons)	Average Adherence Score (Range ^a)	Average Observation Agreement Score (Number of Comparisons)
Parent training programs				
Strengthening Families				
Program 10-14	94% (81-99)	90% (<i>n</i> = 45)	95% (49-100)	95% (<i>n</i> = 76)
Guiding Good Choices	99% (91-100)	99% (<i>n</i> = 35)	99% (88-100)	100% (<i>n</i> = 40)
Parents Who Care	87% (82-91)	88% (<i>n</i> = 7)	94% (86-100)	89% (<i>n</i> = 9)
Family Matters	93% (90-94)	—	98% (95-100)	—
After-school programs				
Stay SMART	98% (95-100)	95% (<i>n</i> = 15)	96% (88-100)	98% (<i>n</i> = 24)
Participate and Learn Skills	80% (60-100)	—	80% (60-100)	—
Big Brothers/Big Sisters	90% (80-100)	—	100%	—
Tutoring	91% (50-100)	—	97% (83-100)	—
Valued Youth	77% (67-95)	—	95% (92-97)	—
School-based programs				
All Stars Core	93%	93% (<i>n</i> = 13)	98% (96-98)	96% (<i>n</i> = 4)
Life Skills Training	89% (81-99)	88% (<i>n</i> = 10)	90% (80-99)	83% (<i>n</i> = 15)
Lion's Quest Skills for Adolescence	73% (72-74)	98% (<i>n</i> = 14)	82% (76-92)	90% (<i>n</i> = 21)
Program Development Evaluation	93%	—	54%	—
Project Alert			95% (94-95)	(<i>n</i> = 0)
Olweus Bullying Prevention Program			100%	NA
Mean	91%	93%	94%	93%

Note: CYDS = Community Youth Development Study.

a. Range: denotes the range of adherence scores across all cycles that were implemented; no range is given when only one cycle was implemented.

material to the program was reported on 7% and 5% of checklists in 2004–2005 and 2005–2006, respectively. Implementer reports of using guest speakers (not trained in the curriculum) or audiovisual material were much less frequent. These patterns of modifications, with deletions reported twice as often as additions, and other changes being less common generally held across the eight programs for which information was available.

These modifications were classified by SDRG staff as problematic deviations or acceptable enhancements. The number of problematic deviations reported by program implementers was minimal. Across all programs for which information was collected, there were only 0.1 deviations per session in each year. Program enhancements were also infrequent, though somewhat higher in 2004–2005 (0.2 deviations per session) than 2005–2006 (0.1

Table 3
Types of Program Modifications Reported by Program Implementers in the CYDS
Intervention Communities, 2004-2006^a

Program	2004-2005				2005-2006			
	Deletions	Additions	Guest Speakers	Audiovisual Aids	Deletions	Additions	Guest Speakers	Audiovisual Aids
Strengthening Families Program 10-14	9.8	0	0	0	12.6	0.5	0.3	0.2
Guiding Good Choices	16.3	16.3	1.6	3.7	11.5	10.6	0.0	2.1
Parents Who Care	0	0	0	14.3	65.0	20.0	5.0	30.0
Stay SMART	2.8	4.6	4.6	0.9	13.3	0.6	0.0	17.2
All Stars Core	9.4	1.0	1.0	3.1	14.3	2.4	0.0	2.4
Life Skills Training	15.5	1.0	1.8	2.7	10.8	0.9	0.0	0.9
Lion's Quest Skills for Adolescence	24.5	21.8	0.9	0.0	18.4	15.3	0.8	5.0
Project Alert					4.5	0.0	0.0	0.0
Mean	12.5	6.8	1.3	1.9	13.8	4.8	0.3	3.7

Note: CYDS = Community Youth Development Study.

a. Percentage of checklists on which program implementers indicated each type of modification.

deviations per session). These results were similar across programs and for each of the communities implementing the same program.

Dosage

Table 4 identifies the dosage requirements and dosage scores achieved for 14 prevention programs implemented in the CYDS during 2004–2006.⁴ Overall, high rates of dosage were demonstrated, with 94% of the required number, length, and frequency of sessions delivered in 2004–2005 and 93% of dosage requirements met in the following year. In addition, 80% of all cycles offered during 2004–2005 met all three dosage requirements, whereas 77% of program cycles met all dosage requirements in 2005–2006.

Dosage scores were highest for the parent training and after-school programs and somewhat lower in the school-based programs. Dosage rates in 2005–2006 ranged from 68% to 96% across the five school programs, and full dosage was achieved in only 6 of the 19 implemented cycles. Of the three dosage elements, school programs were less likely than other types of programs to fully meet frequency requirements. Most teachers were scheduled to deliver one program session per week, but regular delivery was often interrupted by school holidays, teacher illness, special events (e.g., field trips or assemblies), academic testing, or other issues. In the community implementing the Olweus Bullying Prevention Program, only 68% of all teachers delivered the weekly classroom sessions. It was also relatively difficult for teachers to deliver all 40 required lessons in the Lion's Quest Skills for Adolescence program. In 2004–2005, 82% of the required lessons were taught in the two communities implementing this program, whereas 90% of lessons were taught in 2005–2006 in three communities using Skills for Adolescence.⁵

Table 4
Program Dosage in the CYDS Intervention Communities, 2004-2006

Program	Minimum Dosage Requirements	2004-2005		2005-2006	
		Total Dosage Score ^a	Percentage of Cycles With Full Dosage	Total Dosage Score ^a	Percentage of Cycles With Full Dosage
Parent training programs					
Strengthening Families Program 10-14	7, 2-hr weekly sessions	100	100 (15/15)	100	100 (29/29)
Guiding Good Choices	5, 2-hr weekly sessions	99	97 (37/38)	100	100 (48/48)
Parents Who Care	7, 2-hr weekly sessions	94	33 (1/3)	100	100 (4/4)
Family Matters	Completion of material in 6 months	100	100 (2/2)	100	100 (2/2)
After-school programs					
Stay SMART	12, 60-min weekly sessions	99	89 (8/9)	97	60 (9/15)
Participate and Learn Skills	10, 45-min sessions two times per week	97	33 (1/3)	100	100 (3/3)
Big Brothers/Big Sisters	Matches meet two times per month	75	0 (0/2)	93	50 (1/2)
Tutoring	45-min sessions two times per week	94	64 (7/11)	93	46 (13/28)
Valued Youth	45-min sessions four times per week, 30 weeks	92	33 (1/3)	100	100 (3/3)
School-based programs					
All Stars Core	14, 45-min weekly sessions	93	0 (0/1)	96	0 (0/2)
Life Skills Training	12 (Level 1) and 8 (Level 2), 45-min weekly sessions	90	60 (3/5)	88	36 (4/11)
Lion's Quest Skills for Adolescence	40, 45-min weekly sessions	94	0 (0/2)	79	33 (1/3)
Project Alert	11, 45-min weekly sessions	—	—	83	50 (1/2)
Olweus Bullying Prevention Program	Weekly, year-long classroom sessions	—	—	68	0 (0/1)
Mean		94%	80% (76/95)	93%	77% (118/153)

Note: CYDS = Community Youth Development Study.

a. Dosage: the percentage of the required number, length, and frequency of sessions that were achieved, averaged across all implemented cycles.

Quality of Delivery

In addition to measuring the extent to which all lessons and content were delivered, we assessed the quality with which the program implementers delivered the material. According to observer reports, all programs averaged at least a 4.0 on the 5-point quality of delivery score (see Table 5). Average scores were 4.38 in 2004–2005 and 4.59 in 2005–2006, indicating that implementers were well prepared for lessons, knowledgeable in program content, supportive of the program, and able to keep on time during class. There was some variation in the observed quality of delivery across individual implementers, but less than 2% of all teachers had scores of 2.0 or less in each year of implementation, whereas more than 75% of teachers were rated at least a 4.0 in each year (data not shown).

Observers also rated the percentage of each class period devoted to skills practice, discussion, lecture, and video viewing. The results in Table 5 indicate that, across all programs, implementers used a variety of teaching techniques, spending about 30% of each class on practice, 30% on discussion, and 30% on lecture, and the remainder of time in showing videos. It should be noted that the three parenting programs each specify that videos be shown and discussed during each session, and video viewing was more commonly observed in these programs than the others. In addition, the PALS program relies primarily on practice to teach recreation skills, and practice was observed much more frequently in this program than in others. In fact, excluding the PALS program from the calculations reported in Table 5 somewhat changed the mean scores. Rates of practice, discussion, lecture, and video viewing were 27%, 34%, 33%, and 7%, respectively, in 2004–2005 when PALS scores were excluded, and similar changes were observed in 2005–2006 when excluding PALS results.

Participant Responsiveness

Observers also rated how well participants appeared to understand the material and how actively they participated in discussions. In 2004–2005, across nine observed programs, responsiveness was rated 4.38 on a 5-point scale, and scores averaged 4.52 in 2005–2006 (see Table 6). All programs had similarly high rates, with no program rated below a 4.0, and scores did not vary much across different communities implementing the same program. There was more variation in the observed participant responsiveness for individual implementers, but less than 3% of implementers were rated as 2.0 or less in each year of implementation, and more than 87% of implementers were rated at least a 4.0 in each year.

Program Attendance

Table 7 shows the total number of families (in parent training programs) and students (in after-school and school-based programs) who attended at least one session of each program in 2004–2006 and the percentage of participants who attended at least 60% of all delivered sessions. Recruitment of participants was more challenging in parent training and after-school programs compared with school-based programs. Although the first two types of programs reached 500 to 650 participants each year, school programs were delivered to 1,432 students in 2004–2005 and to 3,886 students in 2005–2006. The middle columns in

Table 5
Quality of Program Implementation in the CYDS Intervention Communities, 2004-2006^a

Program	2004-2005					2005-2006				
	Overall Quality	Percentage Practice	Percentage Discuss	Percentage Lecture	Percentage Videos	Overall Quality	Percentage Practice	Percentage Discuss	Percentage Lecture	Percentage Videos
Strengthening Families Program 10-14	4.48	25	34	32	16	4.41	27	29	31	12
Guiding Good Choices	4.27	25	28	31	17	4.61	23	35	29	13
Parents Who Care	4.17	5	40	38	20	4.73	—	—	—	—
Stay SMART	4.30	21	43	34	2	4.67	19	38	40	1
Participate and Learn Skills	4.72	82	7	11	0	4.60	77	8	10	3
All Stars Core	4.61	35	35	28	2	4.75	33	48	19	0
Life Skills Training	4.30	19	42	38	2	4.20	21	37	39	3
Lion's Quest Skills for Adolescence	4.08	35	32	30	2	4.38	—	—	—	—
Olweus Bullying Prevention Program	—	—	—	—	—	4.80	8	52	38	1
Mean	4.38	34	31	29	6	4.58	28	36	30	4

Note: CYDS = Community Youth Development Study.

a. The overall quality score is a mean score on a 10-item scale that ranged from 1 to 5, with higher scores indicating better quality of delivery. The other results indicate the percentage of the program session, on average, that the implementer was observed to use lecture, practice, discussion, and video viewing to teach the material.

Table 6
Participant Responsiveness in the Programs Implemented
in the CYDS Intervention Communities, 2004-2006^a

Program	2004-2005	2005-2006
Strengthening Families Program 10-14	4.61	4.61
Guiding Good Choices	4.28	4.54
Parents Who Care	4.00	4.50
Stay SMART	4.12	4.46
Participate and Learn Skills	4.71	4.61
All Stars Core	4.41	4.75
Life Skills Training	4.25	4.05
Lion's Quest Skills for Adolescence	4.23	4.26
Olweus Bullying Prevention Program	—	4.73
Mean	4.38	4.52

Note: CYDS = Community Youth Development Study.

a. Participant responsiveness was reported by observers based on two questions, each rated on a 5-point scale; higher scores indicate greater responsiveness.

Table 7 show the percentage of participants targeted for recruitment who attended at least one session. In each year, communities served about 10% of the targeted families with parent training services, 20% of targeted students with after-school programs, and nearly all students with school-based programs. There was variation in this outcome across communities, though parent recruitment was difficult in all communities.

Once involved in a program, the majority of participants attended most sessions. As shown in Table 7, about 80% of families and students attended at least 60% of the parent training and after-school sessions delivered in 2004–2006. Nearly all children (96% in 2004–2005 and 91% in 2005–2006) were exposed to at least 60% of the required number of sessions in school-based programs.

Program Challenges

Despite high rates of implementation fidelity over the 2 years, implementers nonetheless faced challenges when delivering programs. According to their self-reports on fidelity checklists for eight programs, the most commonly cited challenge was a lack of time in which to deliver all the required material, which was identified on 20% of all checklists completed in 2004–2005 and 14% of all checklists in 2005–2006 (see Table 8). That fewer implementers rated lack of time as problematic during the second year of program delivery suggests that as teachers gained familiarity with program content and methods they found it somewhat easier to cover the material in the allotted amount of time. Even though the implementers felt pressed for time, observers did not rate sessions as seeming rushed or hurried (two items on the quality of delivery scale). On average, in 2004–2005, observers rated 82% of implementers as keeping on time or well on time and 86% as not being very rushed or hurried during lessons. Scores were even higher in 2005–2006, with 90% of implementers rated at least 4.0 on each item. The discrepancy in reports may be due to

Table 7
Program Participation and Retention in the CYDS
Intervention Communities, 2004-2006

Program Type	2004-2005			2005-2006		
	Participation ^a	Percentage of Target Population (Range ^b)	Retention ^c	Participation ^a	Percentage of Target Population (Range ^b)	Retention ^c
Parent training	517	8% (3-28%)	79%	665	12% (6-46%)	78%
After school	546	17% (7-98)	77%	612	21% (4-96)	81%
School based	1,432	97% (75-100)	96%	3,886	81% (6-100)	91%

Note: CYDS = Community Youth Development Study.

a. Participation: number of families (parent training) or students (after-school and school-based) attending at least one program session.

b. Range: denotes the variation across the different communities offering each type of programming.

c. Retention: percentage of participants attending 60% or more of the delivered sessions.

teachers of school-based programs often using two classroom periods to deliver the content of one lesson to allow full coverage of material and adequate student discussion. Likewise, some communities lengthened parent training sessions (e.g., from 2 to 2.5 hr) to provide meals or allow time for unstructured social interaction.

Other challenges often reported by implementers included participant misbehavior and lack of responsiveness. Together, these issues were reported on 20% of all checklists in 2004–2005 and 13% in 2005–2006. As before, the decline suggests that implementers became more skilled in methods for engaging participants as they mastered the content and delivery methods. Observers rated overall participant engagement as high, but the implementers' reports may nonetheless indicate that they needed to work hard to fully achieve participant responsiveness. Problems with locations or facilities were not frequently reported.

Implementation challenges were great enough to lead to failure of four programs in four communities after the 2005–2006 school year. Two programs (Stay SMART, an after-school drug prevention program for adolescents, and Parents Who Care, a group-based parent training program) were implemented with high adherence, dosage, delivery, and responsiveness, but low rates of participation, even though the implementing communities used multiple recruitment strategies and incentives to encourage participation. The CTC Community Boards in these two sites decided to discontinue these programs because the reach of programming was too limited to achieve the desired community changes in their targeted risk factors and problem behaviors.

The third program failure also involved Stay SMART, implemented in another community. Also citing participant recruitment challenges in the first year, this community moved Stay SMART from an after-school to an in-school delivery to increase participation. A year later, the CTC board decided to replace Stay SMART with LST after learning that their county prevention specialists had been trained in the program model and could help deliver and pay for it in the future, thus increasing the likelihood of program sustainability.

Table 8
Program Implementation Challenges in the CYDS
Intervention Communities, 2004-2006^a

Program	2004-2005				2005-2006			
	Lack of Time	Misbehavior	Lack of Response	Location/Facilities	Lack of Time	Misbehavior	Lack of Response	Location/Facilities
Strengthening Families Program 10-14	8.7	4.0	2.5	0.4	10.8	9.6	4.0	0.5
Guiding Good Choices	28.4	7.9	7.9	2.6	15.7	3.0	3.0	1.7
Parents Who Care	19.0	4.8	0.0	0.0	40.0	0.0	5.0	0.0
Stay SMART	3.7	8.3	5.6	8.3	9.4	10.0	7.2	1.7
All Stars Core	27.1	19.8	34.4	0.0	40.5	9.5	2.4	0.0
Life Skills Training	16.4	16.4	12.7	0.0	10.8	16.8	6.5	0.4
Lion's Quest Skills for Adolescence	50.9	25.5	9.1	0.0	14.9	5.4	3.1	0.4
Project Alert	–	–	–	–	31.8	9.1	0.0	0.0
Mean	20.4	11.1	9.3	1.6	13.5	8.9	4.3	7.5

Note: CYDS = Community Youth Development Study.

a. Percentage of fidelity checklists on which program implementers indicated each type of challenge.

The fourth program failure involved Program Development Evaluation (PDE), a multi-component program in which schools conduct a comprehensive needs assessment; select interventions to address discipline, classroom management, or other identified areas; and monitor their action plan. PDE was successfully launched in one community in 2004–2005, but adherence rates dropped from 93% to 54% during the second year of implementation. The decline occurred in part because the small, rural community could not find a coordinator with the required level of expertise to evaluate and refine program delivery. The CTC Community Board decided to discontinue PDE given that their community lacked the capacity to fully implement the model.

Discussion

In this study, 16 different substance abuse and delinquency prevention programs were successfully implemented by 12 intervention communities using the CTC prevention system. According to implementer and observer reports, large proportions of required material were taught and core components delivered, nearly all lessons were offered in accord with the length and frequency specified by program developers, implementers were prepared and enthusiastic and used a variety of teaching techniques to convey material, and high levels of engagement from program participants were observed.

Prior research has been mixed regarding the degree to which communities can successfully replicate efficacious prevention programs, and few studies have assessed all four components of implementation fidelity emphasized in the literature as important (Dusenbury et al., 2003). In contrast, in this project, scores on adherence, dosage, quality of delivery, and participant responsiveness were uniformly high across 16 programs and

in different communities that replicated the same programs. In most cases, programs were successfully launched in 2004–2005 and strong fidelity was maintained the following year, even as communities implemented additional program cycles and served more participants, and sometimes added new programs to their menu of services. Notably, rates of adherence, quality of delivery, and participant responsiveness all increased slightly over time, and reported challenges decreased slightly from the first to second year. These results suggest that as implementers gained familiarity with the programs, they were better able to cover required material and do so in a way that engaged participants. Importantly, they did not become complacent regarding the need to implement with fidelity, nor did they increase modifications to the curricula. Thus, the findings provide strong evidence that communities can successfully launch new prevention programs and maintain the quality of implementation over time.

In contrast to the current project, prior studies of program implementation fidelity have generally been restricted to either large-scale survey-based projects that could not capture the complexity of program implementation under real world conditions or to single-program evaluations of a small number of facilitators, which have limited generalizability. Although the CYDS is an efficacy trial of the CTC system and proactive technical assistance was provided by SDRG, communities were empowered to select prevention programs that addressed community-specific needs and were responsible for all aspects of program implementation and monitoring. In addition, this project examined fidelity of 16 different programs implemented by multiple implementers in multiple communities. Primarily, quantitative measures were used to assess all four aspects of fidelity, whereas technical assistance contacts provided qualitative information about implementation. Together, these sources allowed a comprehensive assessment of the successes and challenges that occur when practitioners replicate programs.

Even though the high rates of implementation fidelity indicated that these communities effectively replicated almost all of their selected prevention programs, success was not easily achieved. Covering all material in the required amount of time and promoting participant responsiveness was challenging in this study, similar to findings reported elsewhere (Fagan & Mihalic, 2003; Griner Hill et al., 2006). Although implementers may become more adept in overcoming these challenges over time, as suggested here, program designers could help in this area by designing programs that are not too content heavy and that have interactive exercises built into every lesson.

Achieving widespread participation in parent training programs (and, to a lesser extent, after-school programs) was also difficult, despite multifaceted recruitment campaigns and the provision of many incentives (meals, child care, transportation, gifts, etc.). Low participation led two communities to discontinue parent training programs, and other communities often postponed or cancelled scheduled classes when unable to recruit families. Other studies have reported problems recruiting parents to parent training sessions (Bauman, Ennett, Foshee, Pemberton, & Hicks, 2001; Dumka, Garza, Roosa, & Stoerzinger, 1997; Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Spoth & Redmond, 2002), and further research is needed to identify successful recruitment strategies. Likewise, program developers may wish to provide additional program materials and/or technical assistance to aid communities in planning and conducting successful recruitment campaigns.

Although other research has demonstrated that community replications of tested and effective programs resulted in failed implementation (Gottfredson & Gottfredson, 2002; Hallfors & Godette, 2002; Wandersman & Florin, 2003), the four program failures in this research trial represented only 7% of all the programs that were replicated in the 2 years of the study in these 12 communities. It is notable that communities were successful in implementing a large number of program replications (i.e., cycles) and in enacting the comprehensive program monitoring system in which they were trained (evidenced, in part, by the low rates of missingness of implementation data). Moreover, the decision to discontinue programs was made in the context of a successful implementation of the CTC prevention system, particularly the implementation monitoring processes. CTC trains communities to implement effective prevention programs with active oversight and monitoring, so that challenges can be identified early on, steps taken to refine implementation procedures, and decisions to end implementation made only after careful deliberation based on the data. These procedures were followed in the four cases described here. The CTC Community Board members made informed, data-driven decisions not to continue these programs based on program implementation data obtained through their program monitoring efforts.

Although most implementers faced some challenges during replication, barriers to implementation did not significantly affect communities' ability to successfully replicate prevention programs. We attribute implementation success, in the face of obstacles, to the CTC Community Boards' active oversight and involvement in program monitoring. In accord with the CTC prevention operating system, communities were trained in the importance of implementation fidelity and provided with a methodology and tools for achieving fidelity that could be used across the different programs they had chosen to implement. This system allowed communities to identify problems early, before they led to major problems, and suggested steps to take to overcome challenges. For example, program observations conducted by local volunteers provided data on implementers' strengths and deficits, which were then used to give feedback to implementers to improve their delivery of material.

We recognize that the implementation monitoring system designed for this study lacks elements sometimes used to assess implementation fidelity in efficacy trials of programs, such as observations of program sessions by trained researchers. In this study, we wanted to develop an implementation monitoring system that could be used by any community using the CTC prevention system. Thus, research staff did not rate program implementation adherence, dosage, quality of delivery, or participant responsiveness via program observations of live sessions or coding of videotaped lessons. Instead, our primary measures of adherence and dosage were self-reported by program implementers, and prior research has suggested that self-reports of implementation fidelity may be inflated due to social desirability (Lillehoj, Griffin, & Spoth, 2004; Melde, Esbensen, & Tusinski, 2006). Although observations were used to validate self-reports, observations were not conducted for all sessions or for all programs. We requested that CTC communities conduct observations for 10% to 15% of all lessons because we did not think a larger percentage was realistic or sustainable for communities, especially given their reliance on volunteer observers. Although the communities in this study met this goal, doing so was difficult. Most programs were implemented during working hours, implementers (especially school teachers) often changed their schedules without notifying observers, and programs with multiple

lessons and implementers necessitated that a large number of observations be conducted. It is also true that observer reports could have been inflated, given that they were making somewhat subjective evaluations of the quality of delivery and participant responsiveness of their own community members, though communities provided standardized training of observers to minimize bias in their reporting.

Another limitation of this study is that we cannot evaluate scientifically whether the program monitoring system enacted by local CTC coalitions and overseen by SDRG staff was responsible for the high rates of implementation fidelity observed here. We did not randomly assign communities to this system versus monitoring as usual. Likewise, we cannot assess whether or not strong levels of program implementation fidelity directly affected adolescent involvement in substance use and delinquency. In this study, communities were randomly assigned to implement the CTC system as a whole, or to control conditions conducting prevention services as usual, and outcomes will be assessed via communitywide surveys of youth regardless of their degree of involvement in specific prevention programs implemented through the CTC process (see Hawkins et al., in press). This study is testing the effectiveness of the CTC system in affecting community levels of risk, protection, and adolescent problem behaviors. It is not testing the effectiveness of the specific programs selected by CTC communities to address elevated risks.

Despite these limitations, the findings reveal that communities participating in this study and using this system of program monitoring implemented selected prevention programs in strong accordance to the theory, content, and methods specified by program developers. Given the breadth of programs implemented in CTC communities in the study, the results offer strong evidence that communities can successfully implement prevention programs with high implementation fidelity. In addition, the study provides a general methodology and specific measurement tools that can be adopted by community prevention coalitions to monitor important aspects of implementation of prevention programs intended to lead to community-wide reductions in substance use, delinquency, and other adolescent problem behaviors.

Notes

1. Structured programs included the Strengthening Families Program: For Parents and Youth 10-14, Guiding Good Choices, Parents Who Care, Stay SMART, All Stars, Life Skills Training, Lion's Quest Skills for Adolescence, and Project Alert. Unstructured programs included Family Matters, Parenting Wisely, Participate and Learn Skills, Big Brothers/Big Sisters, Tutoring, Valued Youth, Program Development Evaluation, and Olweus Bullying Prevention Program.

2. Dichotomous (yes/no) ratings were used for all programs except Guiding Good Choices, which was measured on a 5-point scale (from not covered to covered well), then dichotomized as either not covered (rated 1), or at least partially covered (rated 2–5), and Program Development Evaluation, which assessed program components using a 3-point rating scale (not met, partially met, or fully met).

3. We did not discount the dosage score if the number of sessions or session length exceeded the requirements.

4. Dosage scores were not calculated for Parenting Wisely or Program Development Evaluation, as the programs do not specify dosage requirements.

5. The overall dosage scores for Skills for Adolescence (94% in 2004–2005 and 79% in 2005–2006) were based on averaging the percentage of required lessons taught with the scores assessed for session length and frequency.

References

- Abbott, R. D., O'Donnell, J., Hawkins, J. D., Hill, K. G., Kosterman, R., & Catalano, R. F. (1998). Changing teaching practices to promote achievement and bonding to school. *American Journal of Orthopsychiatry*, *68*, 542-552.
- Bauman, K. E., Ennett, S. T., Foshee, V. A., Pemberton, M., & Hicks, K. (2001). Correlates of participation in a family-directed tobacco and alcohol prevention program for adolescents. *Health Education and Behavior*, *28*, 440-461.
- Botvin, G. J., Mihalic, S., & Grotzger, J. K. (1998). Life Skills Training. In D. S. Elliott (Ed.), *Blueprints for violence prevention: Book 5* (pp. 1-93). Boulder, CO: Center for the Study and Prevention of Violence, Institute of Behavioral Science, University of Colorado.
- Buston, K., Wight, D., Hart, G., & Scott, S. (2002). Implementation of a teacher-delivered sex education programme: Obstacles and facilitating factors. *Health Education Research*, *17*, 59-72.
- Conduct Problems Prevention Research Group. (2002). The implementation of the fast track program: An example of a large-scale prevention science efficacy trial. *Journal of Abnormal Child Psychology*, *30*, 1-17.
- Dumka, L. E., Garza, C. A., Roosa, M. W., & Stoerzinger, H. D. (1997). Recruitment and retention of high-risk families into a preventive parent training intervention. *Journal of Primary Prevention*, *18*, 25-39.
- Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, *18*, 237-256.
- Dusenbury, L., Brannigan, R., Hansen, W. B., Walsh, J., & Falco, M. (2005). Quality of implementation: Developing measures crucial to understanding the diffusion of preventive interventions. *Health Education Research*, *20*, 308-313.
- Elliott, D. S., & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science*, *5*, 47-53.
- Fagan, A. A., Hawkins, J. D., Hanson, K., & Arthur, M. W. (2008). Implementation fidelity of prevention programs replicated in the Community Youth Development Study. *American Journal of Community Psychology*, *41*, 235-249.
- Fagan, A. A., & Mihalic, S. (2003). Strategies for enhancing the adoption of school-based prevention programs: Lessons learned from the blueprints for violence prevention replications of the Life Skills Training program. *Journal of Community Psychology*, *31*, 235-254.
- Gottfredson, D. C., & Gottfredson, G. D. (2002). Quality of school-based prevention programs: Results from a national survey. *Journal of Research in Crime and Delinquency*, *39*, 3-35.
- Gottfredson, D. C., Kumpfer, K., Polizzi-Fox, D., Wilson, D., Puryear, V., Beatty, P., et al. (2006). The Strengthening Families Washington D.C. Families Project: A randomized effectiveness trial of family-based prevention. *Prevention Science*, *7*, 57-73.
- Griner Hill, L., Maucione, K., & Hood, B. K. (2006). A focused approach to assessing program fidelity. *Prevention Science*, *8*, 25-34.
- Hallfors, D., & Godette, D. (2002). Will the "Principles of Effectiveness" improve prevention practice? Early findings from a diffusion study. *Health Education Research*, *17*, 461-470.
- Hallfors, D. D., Pankratz, M., Hartman, S. (2007). Does federal policy support the use of scientific evidence in school-based prevention programs? *Prevention Science*, *8*, 75-81.
- Hawkins, J. D., & Catalano, R. F. (1992). *Communities That Care: Action for drug abuse prevention*. San Francisco, CA: Jossey-Bass.
- Hawkins, J. D., & Catalano, R. F. (2004). *Communities That Care prevention strategies guide*. South Deerfield, MA: Channing Bete.
- Hawkins, J. D., Catalano, R. F., & Arthur, M. W. (2002). Promoting science-based prevention in communities. *Addictive Behaviors*, *27*, 951-976.
- Hawkins, J. D., Catalano, R. F., Arthur, M. W., Egan, E., Brown, E. C., Abbott, R. D., et al. (in press). Testing Communities That Care: The rationale, design and behavioral baseline equivalence of the Community Youth Development Study. *Prevention Science*.
- Heinrichs, N., Bertram, H., Kuschel, A., & Hahlweg, K. (2005). Parent recruitment and retention in a universal prevention program for child behavior and emotional problems: Barriers to research and program participation. *Prevention Science*, *6*, 276-286.

- Henggeler, S. W., Melton, G. B., Brondino, M. J., Scherer, D. G., & Hanley, J. H. (1997). Multisystemic therapy with violence and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting and Clinical Psychology, 65*, 821-833.
- Kam, C. M., Greenberg, M. T., & Walls, C. T. (2003). Examining the role of implementation quality in school-based prevention using the PATHS curriculum. *Prevention Science, 4*, 55-63.
- Lillehoj, C. J., Griffin, K. W., & Spoth, R. (2004). Program provider and observer ratings of school-based preventive intervention implementation: Agreement and relation to youth outcomes. *Health Education and Behavior, 31*, 242-257.
- Melde, C., Esbensen, F.-A., & Tusinski, K. (2006). Addressing program fidelity using onsite observations and program provider descriptions of program delivery. *Evaluation Review, 30*, 714-740.
- Mihalic, S. (2004). The importance of implementation fidelity. *Emotional and Behavioral Disorders in Youth, 4*, 83-105.
- Mihalic, S., & Irwin, K. (2003). Blueprints for violence prevention: From research to real world settings—Factors influencing the successful replication of model programs. *Youth Violence and Juvenile Justice, 1*, 307-329.
- Rohrbach, L. A., Dent, C. W., Skara, S., Sun, P., & Sussman, S. (2007). Fidelity of implementation in project Towards No Drug Abuse (TND): A comparison of classroom teachers and program specialists. *Prevention Science, 8*, 125-132.
- Spoth, R., Gyll, M., Lillehoj, C. J., Redmond, C., & Greenberg, M. (2007). PROSPER study of evidence-based intervention implementation quality by community-university partnerships. *Journal of Community Psychology, 35*, 981-999.
- Spoth, R. L., Gyll, M., Trudeau, L., & Goldberg-Lillehoj, C. (2002). Two studies of proximal outcomes and implementation quality of universal preventive interventions in a community-university collaboration context. *Journal of Community Psychology, 30*, 499-518.
- Spoth, R. L., & Redmond, C. (2002). Project Family prevention trials based in community-university partnerships: Toward scaled-up preventive interventions. *Prevention Science, 3*, 203-222.
- St Pierre, T. L., Osgood, D. W., Mincemoyer, C. C., Kaltreider, D. L., & Kauh, T. J. (2005). Results of an independent evaluation of Project Alert delivered in schools by cooperative extension. *Prevention Science, 6*, 305-317.
- Tobler, N. S., & Stratton, H. H. (1997). Effectiveness of school-based drug prevention programs: A meta-analysis of the research. *Journal of Primary Prevention, 18*, 71-127.
- Wandersman, A., & Florin, P. (2003). Community intervention and effective prevention. *American Psychologist, 58*, 441-448.

Abigail A. Fagan is Assistant Professor in the Department of Criminology and Criminal Justice at the University of South Carolina. Her research interests include gender and crime, feminist theory, sibling influences on crime, victimization, and implementation of crime prevention programs.

Koren Hanson is Data Manager for the Community Youth Development Study, Social Development Research Group, University of Washington. She has previously conducted data management and analysis on the Seattle Public Schools' Safe Schools/Healthy Students Initiative, a comprehensive effort to integrate school and community policies and services to promote students' healthy development and increase safety in and around school buildings.

J. David Hawkins is Endowed Professor of Prevention, Social Development Research Group, School of Social Work, University of Washington; past President of the Society for Prevention Research; and a fellow of the American Society of Criminology. His research studies include the Seattle Social Development Project, an ongoing longitudinal study that includes a nested preventive intervention, and the Community Youth Development Study, a randomized controlled trial of the Communities That Care prevention operating system involving 24 communities.

Michael W. Arthur is Research Associate Professor, Social Development Research Group, School of Social Work at the University of Washington. He is currently coinvestigator and research director of the Community Youth Development Study, a randomized controlled trial of the Communities That Care prevention system. His research interests include community-level approaches to the prevention of drug use, violence, and delinquency; the assessment of community prevention needs, resources, and readiness; and prevention services research methods.